

## CASE STUDY - Masoning

### TASK TITLE: Masoning

<b>Task Description:</b>	Masonry work involves the use of a number of hand tools of various sizes and shapes. The task may include pouring concrete, smoothing and finishing concrete with treadle. The masonry task can be done at a variety heights and angles. Task duration is dependent on the complexity or nature of the job.  Typical jobs in which masonry is performed include (not necessarily limited to): <ul style="list-style-type: none"><li>• road maintenance and repair</li><li>• construction</li></ul> Some aspects of brick work are also included in this case study.
<b>Job Performance Measures Most Often Impacted by Masoning:</b>	Integrity of the concrete, level surface. Speed of the masonry task.
<b>Typical Employee Comments about Masoning:</b>	Employees typically complain about discomfort and/or stiffness in the hands/wrists/arms, back and legs/feet.
<b>Suggested Level II Analysis:</b>	Postural Analysis, Elemental Task Analysis, Dynamic Task Analysis, NIOSH Lifting Analysis (if applicable).

## Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes	Cost	Impact On	
			✓ Minor Modification	✓ Major Change	Quality	Productivity
1. Reaching	<ul style="list-style-type: none"> <li>• Work location is too high</li> <li>• Work location is too far away (see Fig 1.1)</li> </ul>  <p><b>Figure 1.1</b></p>	123. Raise the person <ul style="list-style-type: none"> <li>• use a step stool, platform or ladder</li> <li>• provide an adjustable platform or scaffolding</li> </ul> 117. Provide support for the upper body <ul style="list-style-type: none"> <li>• move with the work side to side—move feet rather than the arms</li> </ul> 20. Incorporate rest pauses	<input checked="" type="checkbox"/> ✓ Minor Modification	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ✓ Major Change	med high med	med med med
2. Arm forces: Repeated contraction of the muscles of the arm or holding/carrying materials	<ul style="list-style-type: none"> <li>• Carrying and lifting bricks               <ul style="list-style-type: none"> <li>– holding/lifting unstable loads</li> <li>– no hand holds</li> </ul> </li> <li>• Throwing bricks or other supplies up to higher elevations or to scaffold</li> </ul>	48. Provide a cart <ul style="list-style-type: none"> <li>• transport bricks on transport trolley</li> </ul> 61. Provide a mechanical lift device <ul style="list-style-type: none"> <li>• use a bucket and pulley system to raise and lower supplies</li> </ul>		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> ✓	med med	med high
3. High Speed sudden shoulder movements	<ul style="list-style-type: none"> <li>• Rarely occurs</li> </ul>	N/A				
4. Head/neck	<ul style="list-style-type: none"> <li>• Looking down to monitor</li> </ul>	20. Incorporate rest pauses	<input checked="" type="checkbox"/>		low med	med

### **Shoulder/Neck**

bent or twisted	quality of work						
-----------------	-----------------	--	--	--	--	--	--

## Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes	Cost	Impact On	
			✓ Minor Modification	✓ Major Change	Quality	Productivity
5. Bent wrists repeated wrist movements or repeated forearm rotation	<ul style="list-style-type: none"> <li>Using hand treadle tool on a horizontal surface (see Figure 1.2)</li> </ul> 	<p>77. Provide a tool with an appropriate handle angle</p> <ul style="list-style-type: none"> <li>provide angled/bent tool handle for different tasks</li> <li>Add a multi-position hinge to current tool handles to maximize flexibility</li> </ul>	✓	✓	med low	med med
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A				
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A				
8. Hand/grip forces	<ul style="list-style-type: none"> <li>Tool or materials are too heavy</li> <li>Handle is too heavy or large for easy gripping</li> </ul>	<p>59. Provide a lighter weight tool</p> <p>13. Encourage ergonomic work techniques</p> <ul style="list-style-type: none"> <li>avoid picking up more than one brick at a time</li> <li>pick up items at a point where the weight is balanced</li> </ul>	✓  ✓	✓	med low low	med med med

## Hands/Wrists/Arms(cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes	Cost	Impact On	
			✓ Minor Modification	✓ Major Change	Quality	Productivity
		<p>76. Provide a tool which requires minimal force to use</p> <ul style="list-style-type: none"> <li>• all tools which must be pulled or used as spreaders should be equipped with full handles</li> </ul>		✓	med	med
9. High speed hand/wrist/arm movements or vibration, impact or torque to the hand	<ul style="list-style-type: none"> <li>• Design or poor condition of tamping tool can expose worker to high levels of impact or vibration</li> </ul>	<p>74. Provide a tool that minimizes exposure to vibration/impact/torque</p> <ul style="list-style-type: none"> <li>• inspect and repair tool on a regular basis to eliminate unnecessary vibration</li> <li>• provide a tool that emits less vibration</li> </ul> <p>13. Encourage ergonomic work techniques</p> <ul style="list-style-type: none"> <li>• keep the tamping tool upright and level</li> <li>• let the weight of the tamping tool do the work-the worker should only guide the tool</li> </ul>	✓	✓	med	med
10. Exposure to hard edges	<ul style="list-style-type: none"> <li>• Rarely occurs</li> </ul>	N/A				

## Hands/Wrists/Arms(cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
11. Hands and fingers exposed to cold temperatures	• Work area is too cold	110. Provide shields or barriers from the wind 12. Encourage appropriate seasonal clothing 93. Provide appropriate gloves	✓	✓	med	med	med
				low	med	med	med
			✓	low	med	med	med

## Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes	Cost	Impact On	
			✓ Minor Modification	✓ Major Change	Quality	Productivity
12. Repeated forward or sideways bending movements	<ul style="list-style-type: none"> <li>Work location is too low (see Figure 1.3)</li> </ul> 	20. Incorporate rest pauses  31. Lower the person <ul style="list-style-type: none"> <li>provide a chair or stool to sit on (for certain bricking applications)</li> </ul> 117 Provide support for the upper body	✓  ✓  ✓	low  med  med	med  med  med	med  med  high
13. Twisting of the lower back	<ul style="list-style-type: none"> <li>Work location is blocked or is in an inappropriate orientation</li> </ul>	132. Remove obstructions  38. Move closer to the work location	✓  ✓	low  low	med  med	med  med
14. High speed, sudden movements	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A				
15. Static awkward back postures	<ul style="list-style-type: none"> <li>Work location is too low</li> </ul>	20. Incorporate rest pauses  31. Lower the person <ul style="list-style-type: none"> <li>provide a chair or stool to sit on (for certain bricking applications)</li> </ul> 117 Provide support for the upper body	✓  ✓  ✓	low  med  med	med  med  med	med  med  high

## Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
16. Lifting forces	<ul style="list-style-type: none"> <li>• Lifting weights such as stacks of bricks or tamper or stacks of reinforcement bars             <ul style="list-style-type: none"> <li>– holding/lifting unstable loads</li> <li>– no hand holds</li> </ul> </li> </ul>	<p>61. Provide mechanical lift device</p> <ul style="list-style-type: none"> <li>• transport bricks on transport trolley</li> <li>• use straps at each end to load and use two employees to carry the load</li> <li>• use a bucket and pulley system to raise and lower bricks or other materials</li> </ul> <p>78. Provide a wheel barrow</p> <p>126. Reduce carry distance</p> <ul style="list-style-type: none"> <li>• drive vehicle closer to work area to unload bricks</li> </ul> <p>13. Encourage ergonomic work techniques</p> <p>4. Change lifting/carrying task to a rolling or sliding task</p> <ul style="list-style-type: none"> <li>• add wheels to tamping tool or other heavy or bulky equipment to facilitate transport to the work area</li> </ul>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	med med med med med med med med	med med med med med med med med	med med med med high med med high

## Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
17. Pushing or pulling	<ul style="list-style-type: none"> <li>• Pushing or pulling wheel barrel               <ul style="list-style-type: none"> <li>– Poor wheel design</li> <li>– Poor wheel maintenance</li> </ul> </li> </ul>	<p>19. Improve wheel condition</p> <ul style="list-style-type: none"> <li>• repair wheels</li> <li>• provide wheels with appropriate bearings and tread composition</li> </ul> <p>13. Encourage ergonomic work techniques</p> <ul style="list-style-type: none"> <li>• avoid overloading carts or wheel barrels</li> </ul>	✓	✓	med med	med med	med med
18. Whole body vibration	<ul style="list-style-type: none"> <li>• Rarely occurs</li> </ul>	N/A			low	med	med

## Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
19. Fixed position, standing	<ul style="list-style-type: none"> <li>Standing surface is hard</li> </ul>	86. Provide an appropriate anti-fatigue mat  96. Provide appropriate shoe inserts	✓	✓	med	med	med
20. Exposure to hard edges on legs, knees and feet	<ul style="list-style-type: none"> <li>Kneeling causes external pressure to the knees</li> </ul>	95. Provide appropriate knee protection <ul style="list-style-type: none"> <li>provide knee pads</li> <li>provide a cushion to kneel on</li> </ul>	✓	✓	med low	med med	med med
21. Awkward leg positions	<ul style="list-style-type: none"> <li>Work location is too low</li> </ul>	31. Lower the person <ul style="list-style-type: none"> <li>provide a stool or chair to sit on, if appropriate</li> </ul>	✓		med	med	med
22. Standing foot pedal	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					

## Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
23. Difficult to see/light levels too low/high	• Rarely occurs	N/A					
24. Intensive visual tasks, staring at work objects for long periods	• Rarely occurs	N/A					